

## CLAIMS

1. A rotary motor molecule  $V_1$ -ATPase rotating in the presence of ATP, which is a complex molecule having three A subunits, three B subunits  
5 and one D subunit constituting the  $V_1$  portion of a  $V_0V_1$ -ATPase.
2. The rotary motor molecule  $V_1$ -ATPase of claim 1, which has heat resistance.
- 10 3. The rotary motor molecule  $V_1$ -ATPase of claim 2, which is derived from a thermophile bacteria, *Thermus thermophilus*.
4. The rotary motor molecule  $V_1$ -ATPase of claim 3, which is a complex molecule having three peptides of SEQ ID NO:3 corresponding to  
15 the A subunit, three peptides of SEQ ID NO:4 corresponding to the B subunit, and one peptide of SEQ ID NO:5 corresponding to the D subunit.
5. The rotary motor molecule  $V_1$ -ATPase of claim 4, which has at least one substitution of Ala residue for the 232nd Ser residue and Ser residue  
20 for the 235th Thr residue in SEQ ID NO:3.
6. The rotary motor molecule  $V_1$ -ATPase of any one of claims 1 to 5, wherein at least one of the A subunit and the B subunit thereof is fixed on  
25 a substrate.
7. The rotary motor molecule  $V_1$ -ATPase of claim 6, which is fixed on the substrate via a His tag bound to the N terminal of the A subunit.
8. The rotary motor molecule  $V_1$ -ATPase of any one of claims 1 to 7, to  
30 which a D subunit is bound with a joint material.

9. The rotary motor molecule  $V_1$ -ATPase of claim 8, wherein the joint is bound to at least one of Cys residue substituted for the 48th Glu residue and Cys residue substituted for the 55th Gln residue in SEQ ID NO: 5.

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10. The rotary motor molecule  $V_1$ -ATPase of claim 9, wherein all Cys residues in the A subunit and the B subunit are replaced by non-Cys residues.